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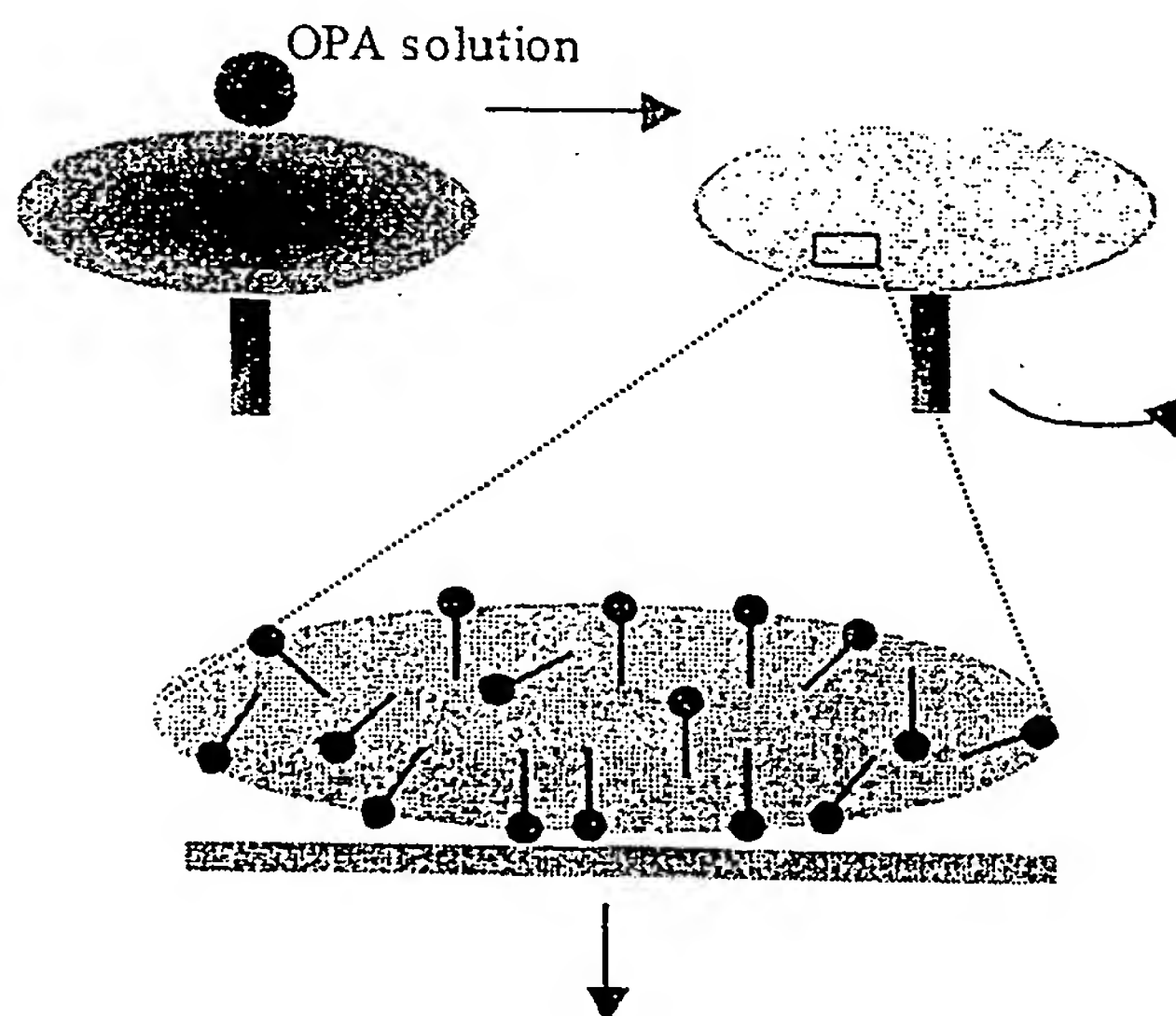
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(54) Title: METHOD OF CONTROLLABLE MORPHOLOGY OF SELF-ASSEMBLED MONOLAYERS ON SUBSTRATES



(57) Abstract: Method of controlling the morphology of
self-assembled monolayers (SAMS) on substrates having
hydrophilic surfaces. The hydrophilic surface is exposed to a
fluid having a mixture of molecules which can self-assemble
on the hydrophilic surface and hydrophobic molecules for
a sufficient length of time so that the molecules which can
self-assemble on the hydrophilic surface form a complete
self-assembled monolayer. In a particular embodiment
octadecylphosphonic acid (OPA) molecules have been
self-assembled on oxidized substrates including but not
limited to mica, silicon, sapphire, quartz and aluminum by
spin-coating a solution containing the octadecylphosphonic
acid (OPA) molecules and hydrophobic molecules such
as chloroform or trichloroethylene under a controlled
relative humidity. Control of the morphology of OPA
SAMS is affected by adjusting humidity and the duration of
spin-coating. Atomic force microscopy revealed that relative
humidity has a profound influence on the morphology of the
OPA SAMS formed. When sufficient molecules are applied
either consecutively or separately, the final morphology will
be a complete monolayer, regardless of the relative humidity.